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wary customers, the electric current is really employed in this piece of apparatus. The device consists of five type-wheels with connecting gear, disposed on a single axis; and the minute, the hour, the day, the month, and the year are correctly placed in line under the impression-pad. The minute-wheel is actuated by any clock, through the instrumentality of an electric current, which shifts it round minute by minute, a pawl carrying round the hour-wheel when sixty movements have been made. The apparatus is under trial at the London General Post-Office for dating telegrams.

THE PRODUCTION OF ELECTRIC CURRENTS BY MECHANICAL ACTIONS. — The following interesting experiment is due to M. Siljestroem. Two hollow iron cylinders were closed at one end by the same plate of german silver, and were plunged in ice. They were connected with a galvanometer, and, when the air in one of them was compressed to 86 atmospheres, a current was observed which was in the opposite direction to that which would be produced by an elevation of temperature, although there was a momentary current in the same direction as the latter.

EDISON ILLUMINATING COMPANIES. — The development of the electric-light business is well shown in the holding in Kansas City, on Feb. 12-13, of the semi-annual convention of the Association of Edison Illuminating Companies, a full report of which appears in the *Electrical Review*. The Edison meetings of this kind have invariably been for "business." The policy of President John I. Beggs has always been to hold the convention closely to its work up to the final adjournment, leaving the question of recreation as a secondary consideration. The convention, while not as large as on former occasions in the number of delegates in attendance, was one of absorbing interest, the papers were more numerous and comprehensive than at previous meetings, and there was nothing lacking in the discussions of the vital features of the business with the exception of the unavoidable absence of Mr. Edison and President Johnson, of the Light Company. It was but natural that a sense of exultation at the prospect of speedy results in the fight for the supremacy (which, if the patent laws of the United States mean any thing, are now near at hand) should be evident in all the utterances of the discussions. The cloud of uncertainty which long litigation always brings seemed to be lifted, and a tone of assurance and expectancy was one of the marked features of the session. A paper was read by J. H. Vail, general superintendent of the Edison Electric Light Company, on electric railways and their relations to Edison central stations, illustrating by statistics the advantages to be derived from their operation by Edison illuminating companies. A detailed statement was made by J. H. McClement, comptroller of the parent company, on the progress of the patent litigation. This was supplemented in the evening by a stereopticon entertainment arranged by W. J. Jenks, director of the Standardizing Bureau, showing in a series of slides the history of Mr. Edison's work. An interesting discussion of the results of the use of the Edison chemical meter brought out a paper of great practical interest by E. A. Kennelly of the Edison laboratory, under whose direct supervision experiments have been conducted the past year. The meter has been cheapened both in first cost and expense of maintenance, and samples of new types are now being made for the Paris Exposition. The possible errors, never large under reasonable management, have practically disappeared. A paper on the "Commercial Mean of the Incandescent Lamp," by Mr. Edison, was read by Mr. Upton of the Edison Lamp Company. This set forth in amplified form the practical results of the operation of the laws regarding lamp efficiency brought out some time ago by John W. Howell. It also detailed some interesting facts as to lamp breakage in central stations. The discussions developed the fact that one result of Mr. Edison's experimental work has been to secure fifty per cent more light from the same energy expended, while fully maintaining the guaranteed life of lamps, as a matter of actual record. The other papers were on "Medical Applications of Current from Central Stations," by J. W. Parcell, jun., of the Sprague Electric Railway and Motor Company; "The Steam-Engine," by Professor William D. Marks of Philadelphia; "Inspections," by W. J. Jenks. The executive committee reported in favor of holding the next meeting at Niagara Falls.

NOTES AND NEWS.

IT is announced that Great Britain, France, Germany, Spain, Italy, Denmark, the Netherlands, Norway and Sweden, Brazil, Uruguay, Chili, Japan, and the Sandwich Islands have signified their intention of sending representatives to the International Conference which is shortly to be held to consider some means of signalling at sea that will render collisions less liable to occur than under the present system. The proposed conference is the result of a letter addressed to the different maritime powers of the world by the President of the United States, asking their co-operation in this matter. The date and place for holding the meeting yet remain to be fixed.

— Russia's boldness in pushing on her railway system across the Turcoman region to Central Asia has received its due reward. Already the line is declared to be paying its working expenses; and Gen. Annenkoff, the designer, has been encouraged thereby to ask permission of the Emperor to extend the line still farther to Tashkent. In all probability, the request, according to *Engineering*, will be acceded to, because Tashkent, besides being the administrative centre of the province of Turkestan, is a town with a population of 100,000 people, and the extension of the Samarcand section thither would not only tie an important political and trading centre to the Russian railway system, but also link the Syr Daria River and the Aral communications with those of the Caspian. The Aral fleet, as originally established, used to ply on the Syr Daria River, along the banks of which the Russians marched, and founded a series of forts and colonies, in their advance upon Tashkent and Samarcand. The great drawback the steamers had always to contend with was the absence of any fuel except a kind of brierwood known as saxaul. If the Samarcand line were extended to Tashkent, it would cross the navigable head of the river on its way, and be able to provide the steamers with liquid fuel from the Caspian, similar to the supply the railway was able to accord to those on the Oxus when it penetrated to that river a year ago. North of Tashkent stretches a series of steppes, adjoining those of Siberia, which are being gradually settled by colonists from Russia. This region, which is well adapted for agricultural and pastoral pursuits, would benefit considerably by the extension of the railway to Tashkent; so that Gen. Annenkoff has many cogent reasons, besides those of a military character, to adduce in support of his project. It is curious to contrast this activity of the Russians with the lethargy of English authorities in regard to the Indian frontier communications. If the completion of the Quetta line to Candahar would not pay the whole working expenses of the railway from the Indus, it would at least more than pay that on the extension, while adding immeasurably to the security of the Indian Empire. In Burmah again, where Gen. Sir Frederick Roberts, four years ago, urged upon the government the rapid construction of railways as a means of pacifying the country, no important lines, except the slow-paced Tounghoo-Mandalay line, have been taken in hand, and money is being wasted in punitive expeditions against dacoits and tribesmen, which would have been far more advantageously spent on railway-works.

— For paving streets, India-rubber threatens to enter into competition with asphalt. This new pavement, according to the *Engineering and Building Record*, is the invention of Herr Busse of Linden, Prussia, who has introduced it in Hanover. He used it first in the summer of 1887 for paving the Goethe Bridge, which has a surface of about 1,000 square metres, or 10,764 square feet. The new pavement, it is stated, proved so satisfactory that 1,500 square metres (16,146 square feet) of ordinary carriage-way in the city were paved with it last summer. The Berlin corporation, being favorably impressed with the new pavement, has had a large area paved with India-rubber as an experiment, and the magistracy of Hamburg is likewise trying the pavement. It is asserted that the new pavement combines the elasticity of India-rubber with the resistance of granite. It is said to be perfectly noiseless, and unaffected either by heat or cold. It is not so slippery as asphalt, and is more durable than the latter. As a covering for bridges, it ought to prove excellent, as it reduces vibration; but a question may be asked as to its cost. The expense must be heavier than that of any known pavement.